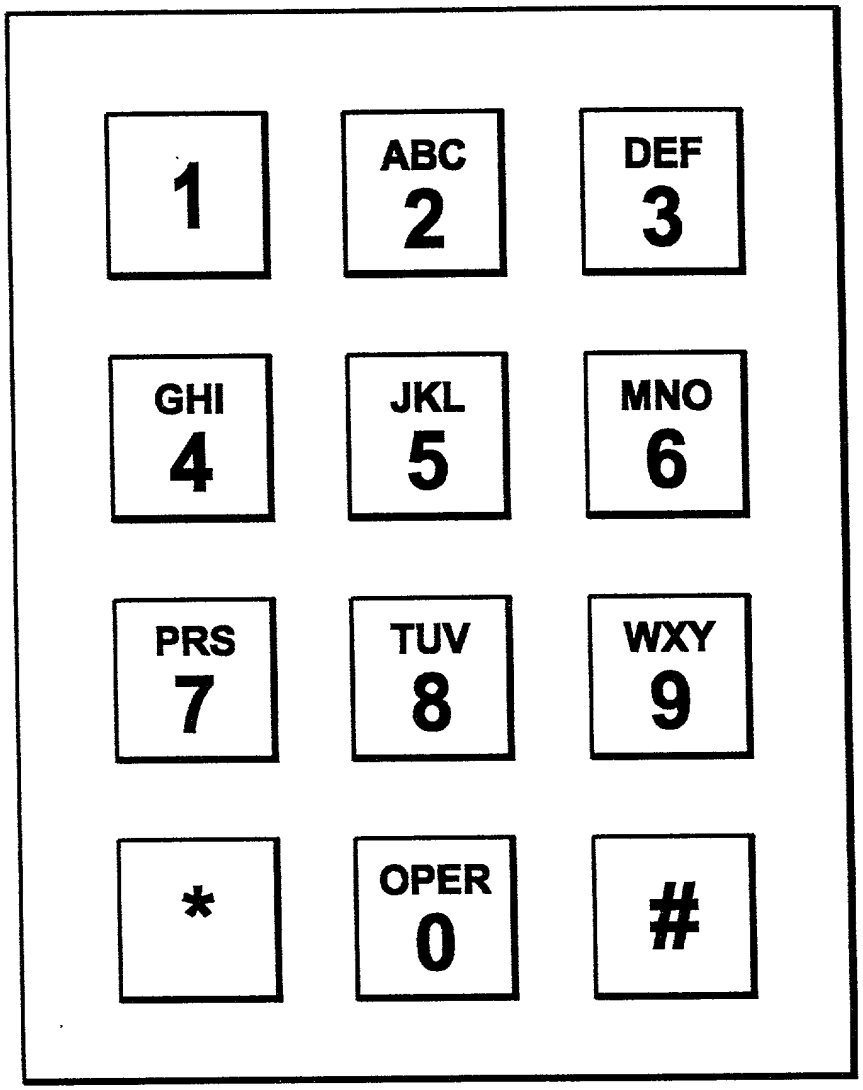


FIG. 1
PRIOR ART

Fig. 2A

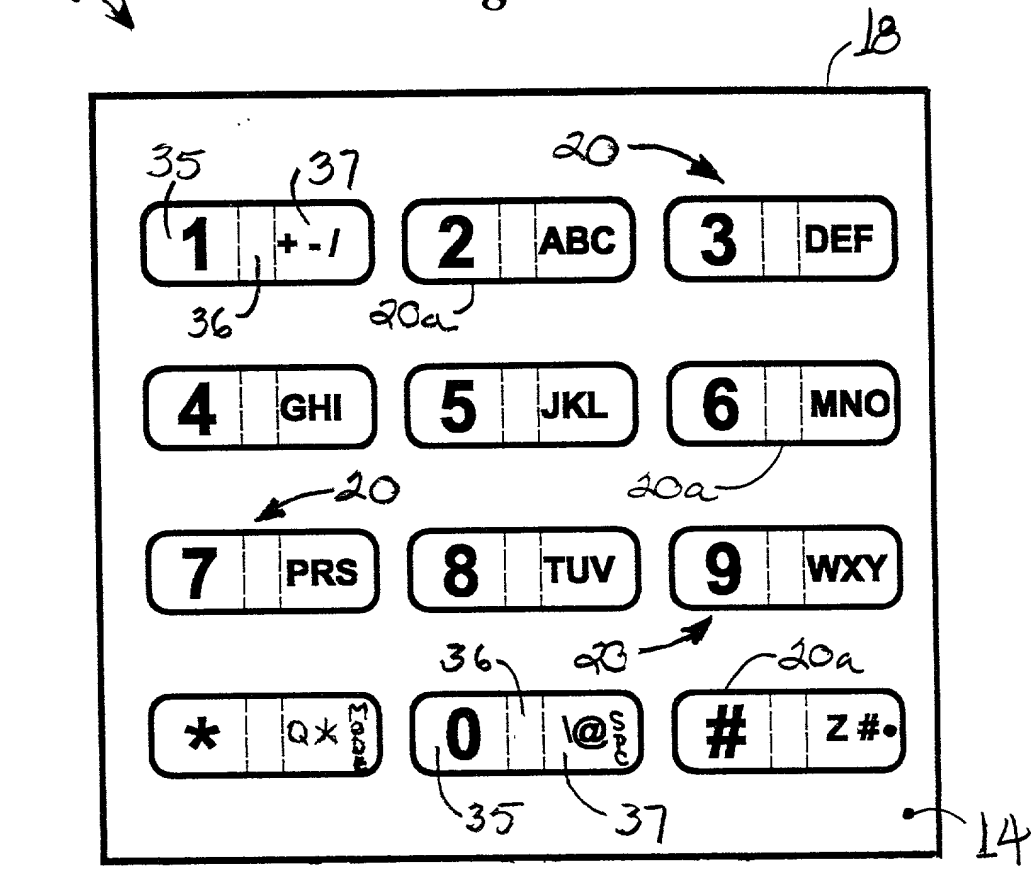
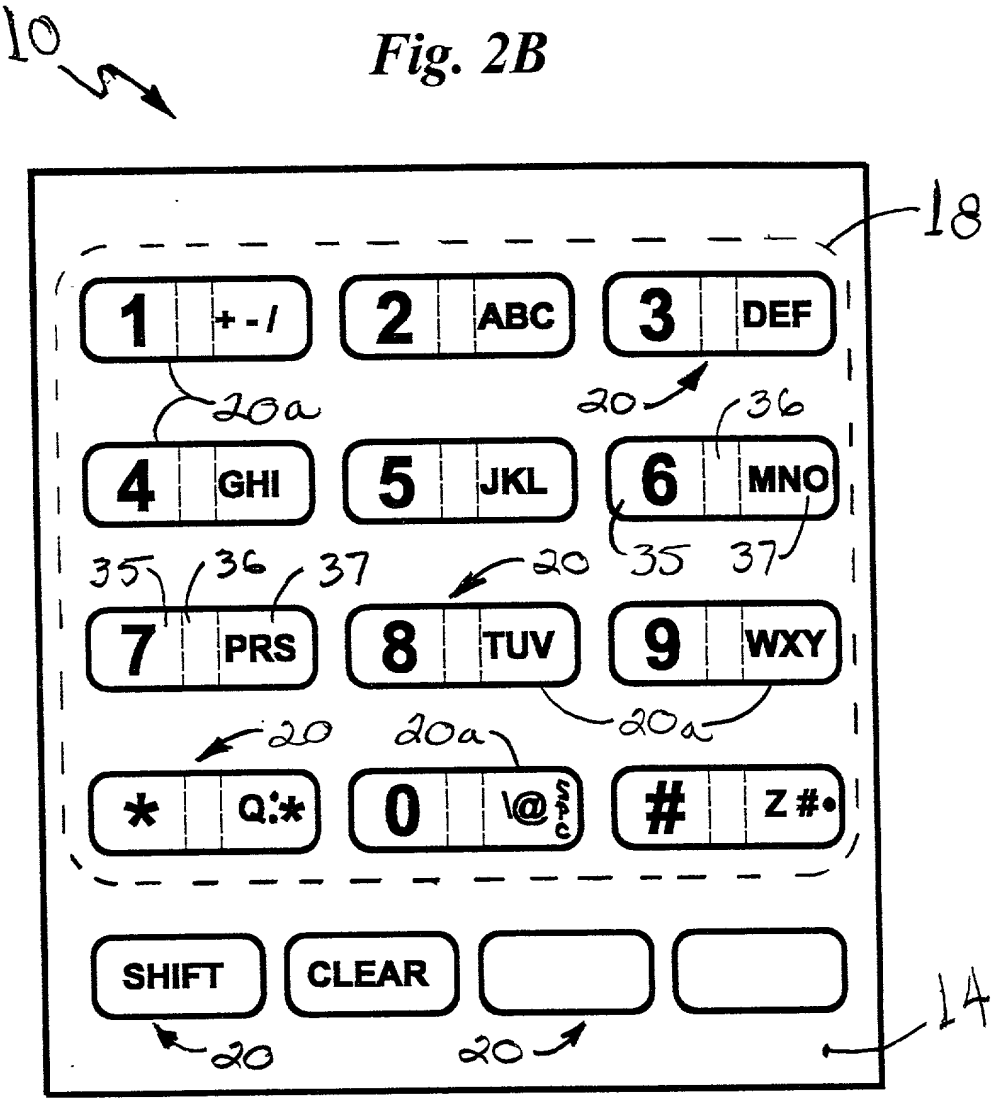

10
18
35
37
20
1
+ - /
2
ABC
3
DEF
36
20a
4
GHI
5
JKL
6
MNO
20a
20
7
PRS
8
TUV
9
WXY
36
23
20a
*
Q * Mode
0
\@ SPC
#
Z # •
35
37
14

Fig. 2B


10
18
1
+ - /
2
ABC
3
DEF
20a
20
36
4
GHI
5
JKL
6
MNO
35
36
37
20
35
37
7
PRS
8
TUV
9
WXY
20
20a
20a
*
Q:*
0
\@
#
Z #•
SHIFT
CLEAR
20
20
14

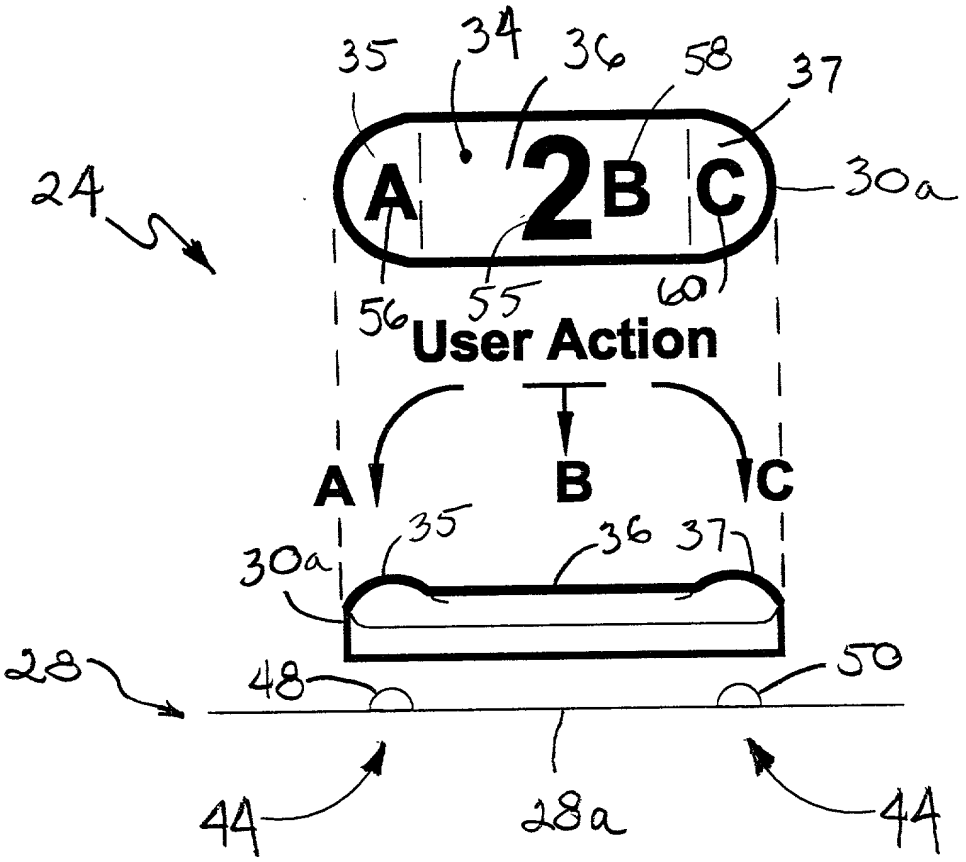

35
34
36
58
37
24
A
2B
C
30a
56
55
60
User Action
A
B
C
35
36
37
30a
28
48
50
44
28a
44

FIG. 3A

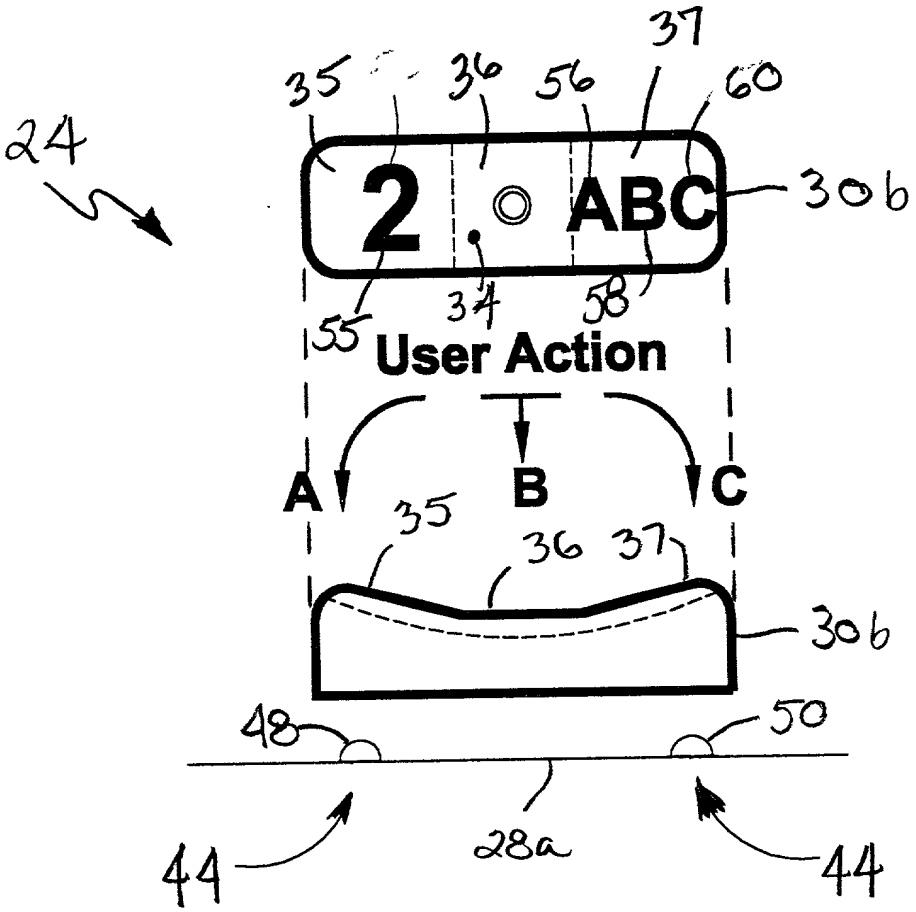

24
35
36
56
37
60
2
ABC
30b
55
37
58
User Action
A
B
C
35
36
37
30b
48
50
44
28a
44

FIG. 3B

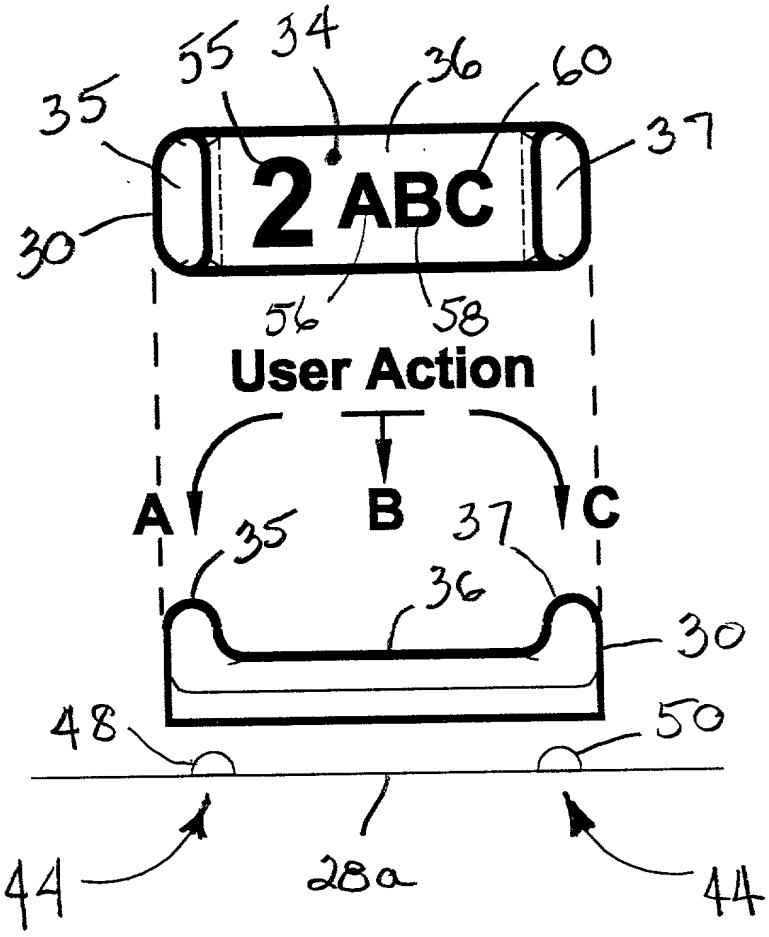

55
34
36
60
35
37
2 ABC
30
56
58
User Action
A
B
C
35
37
36
30
48
50
44
28a
44

FIG. 3C

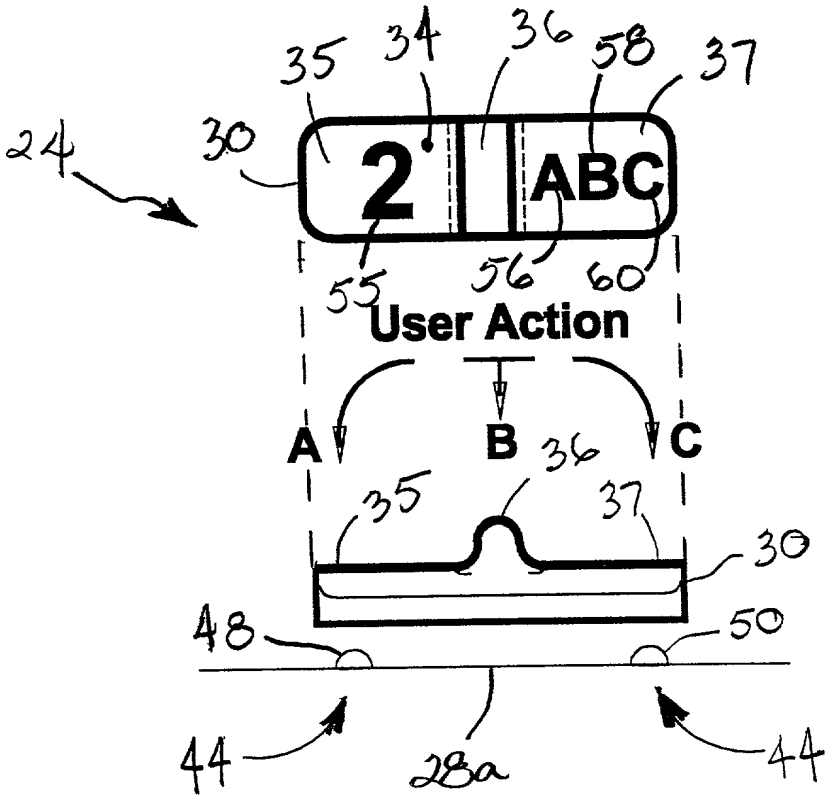

35
34
36
58
37
24
30
2
ABC
55
56
60
User Action
A
B
36
C
35
37
30
48
50
44
28a
44

FIG. 3D

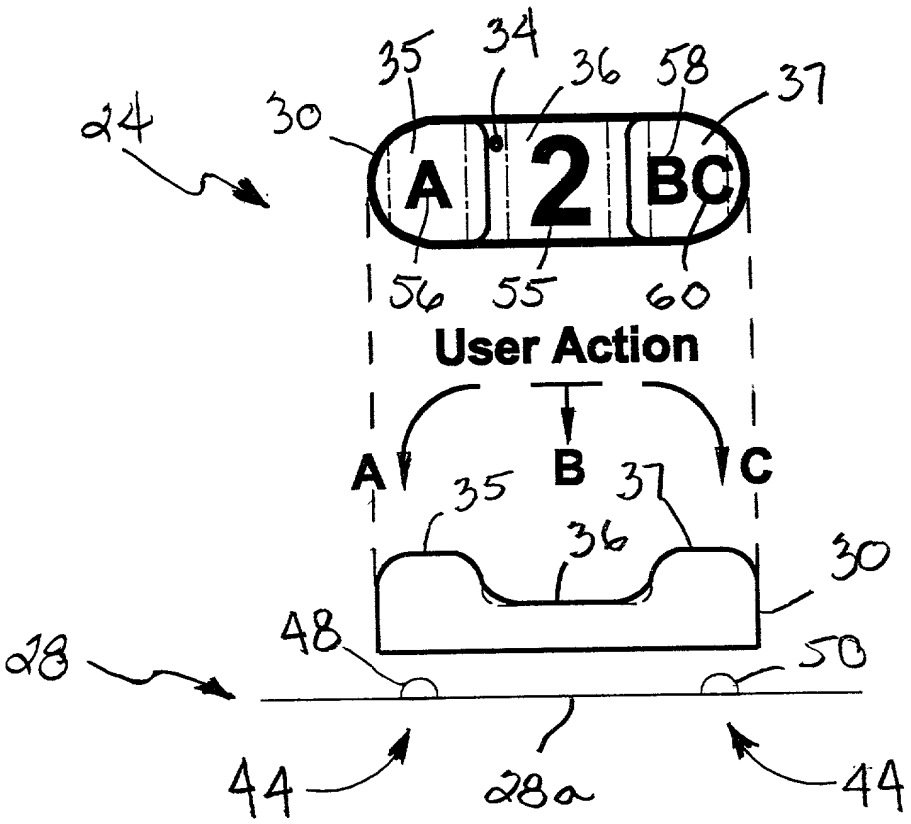

24
30
35
34
36
58
37
A
2
BC
56
55
60
User Action
A
B
C
35
37
36
30
48
50
28
44
28a
44

FIG. 3E

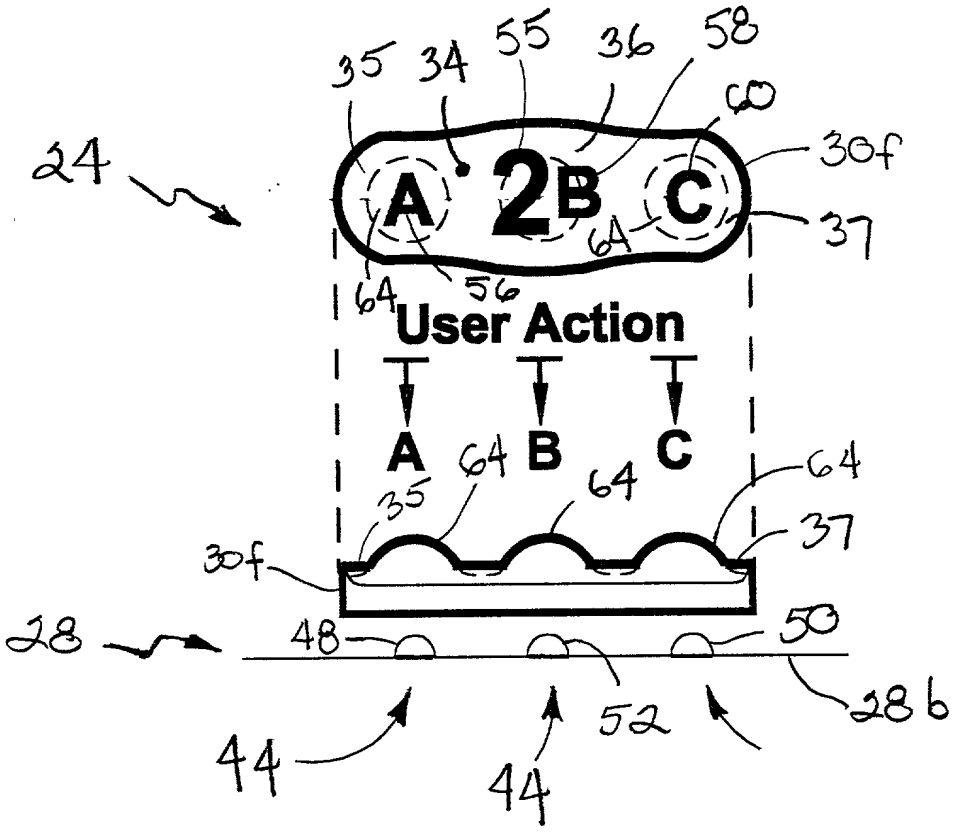

24
35
34
55
36
58
60
30f
A
2B
C
37
64
56
64
User Action
A
64
B
64
C
64
35
37
30f
28
48
50
28b
52
44
44

FIG. 4A

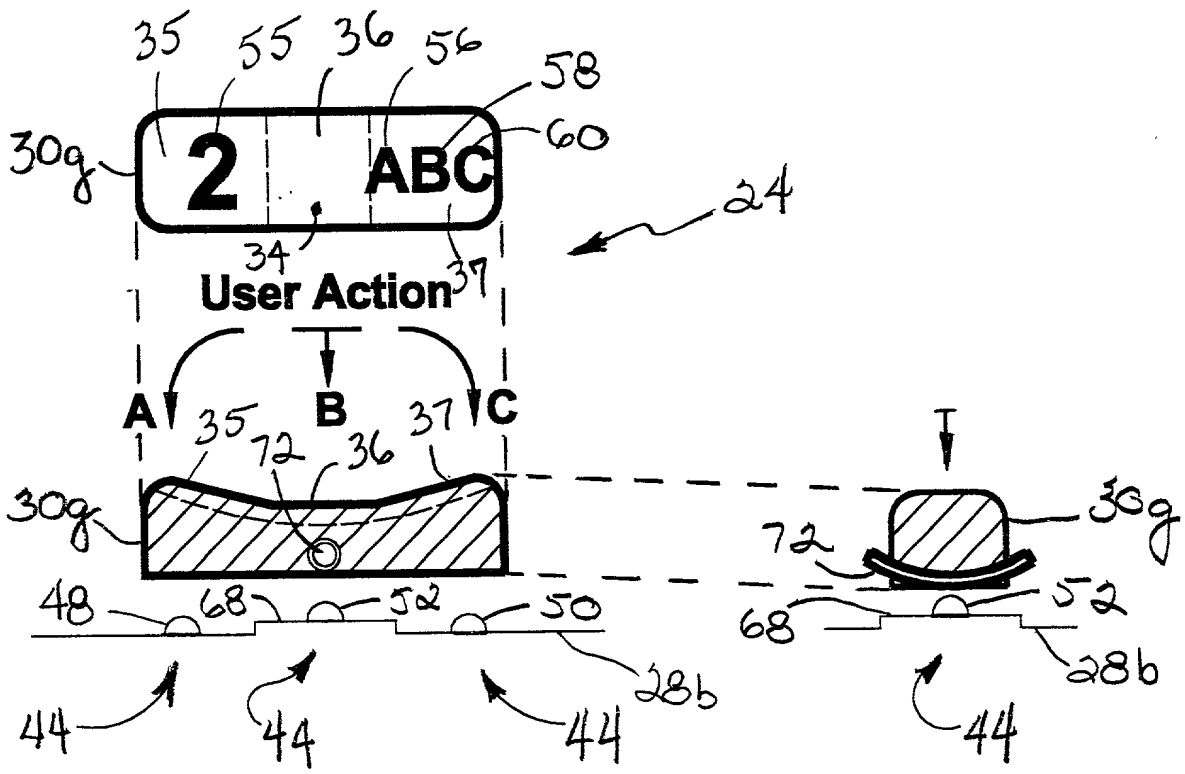

35
55
36
56
58
60
30g
2
ABC
24
34
37
User Action
A
B
C
35
72
36
37
30g
48
68
52
50
28b
44
44
44
T
30g
72
52
68
28b
44

FIG. 4B

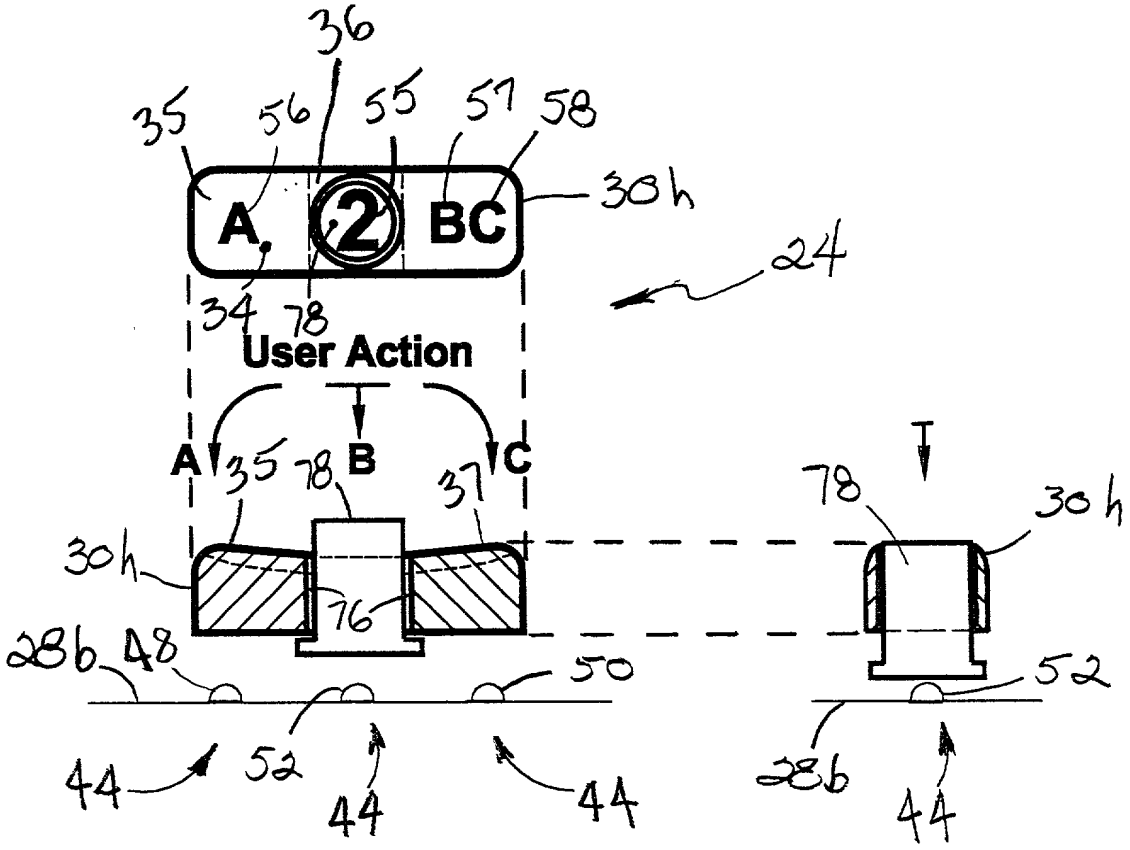

36
35
56
55
57
58
A
2
BC
30h
24
34
78
User Action
A
35
78
B
37
C
78
30h
30h
76
28b
48
50
52
44
52
44
44
28b
44

FIG. 4C

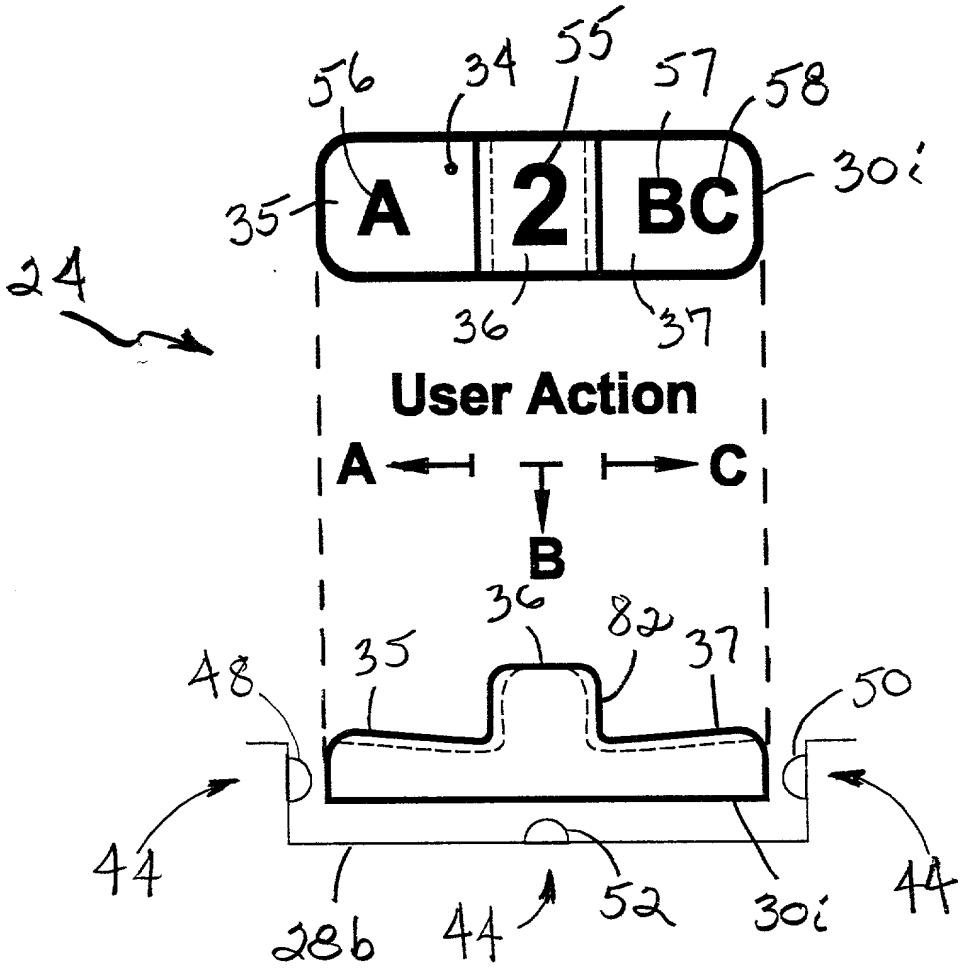

56
34
55
57
58
35
A
2
BC
30i
24
36
37
User Action
A
C
B
36
82
35
37
48
50
44
44
52
30i
44
28b

FIG. 4D

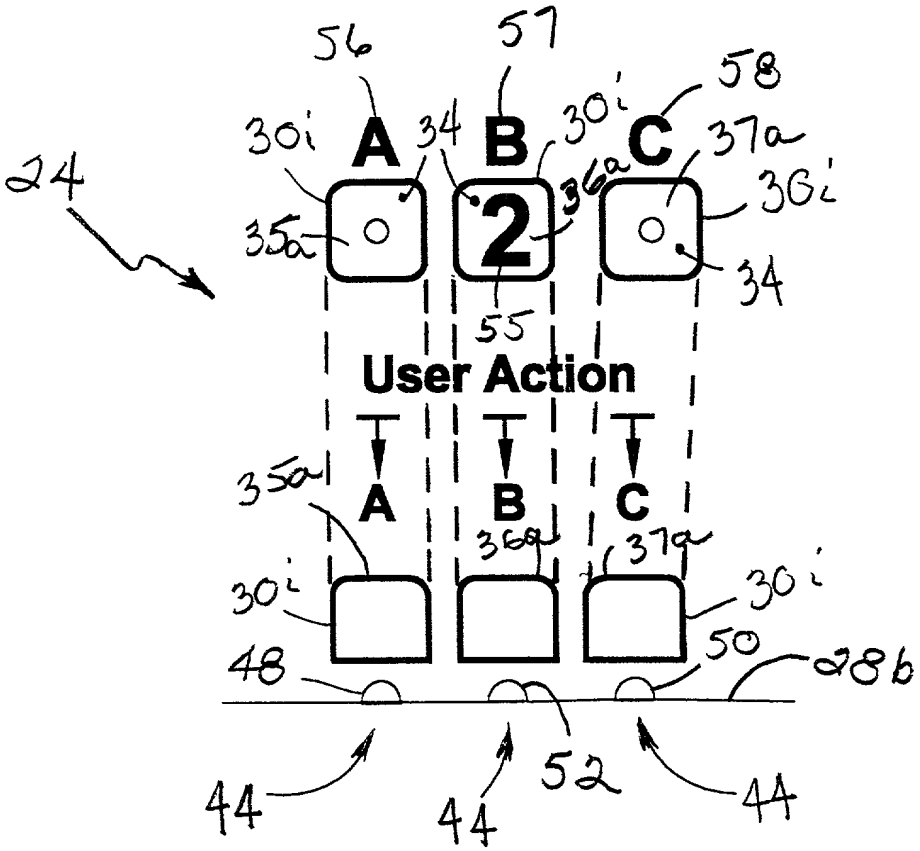

56
57
58
30i
A
34
B
30i
C
37a
24
36a
36i
35a
2
34
55
User Action
35a
A
B
C
36a
37a
30i
30i
48
50
28b
44
44
52
44

FIG. 4E

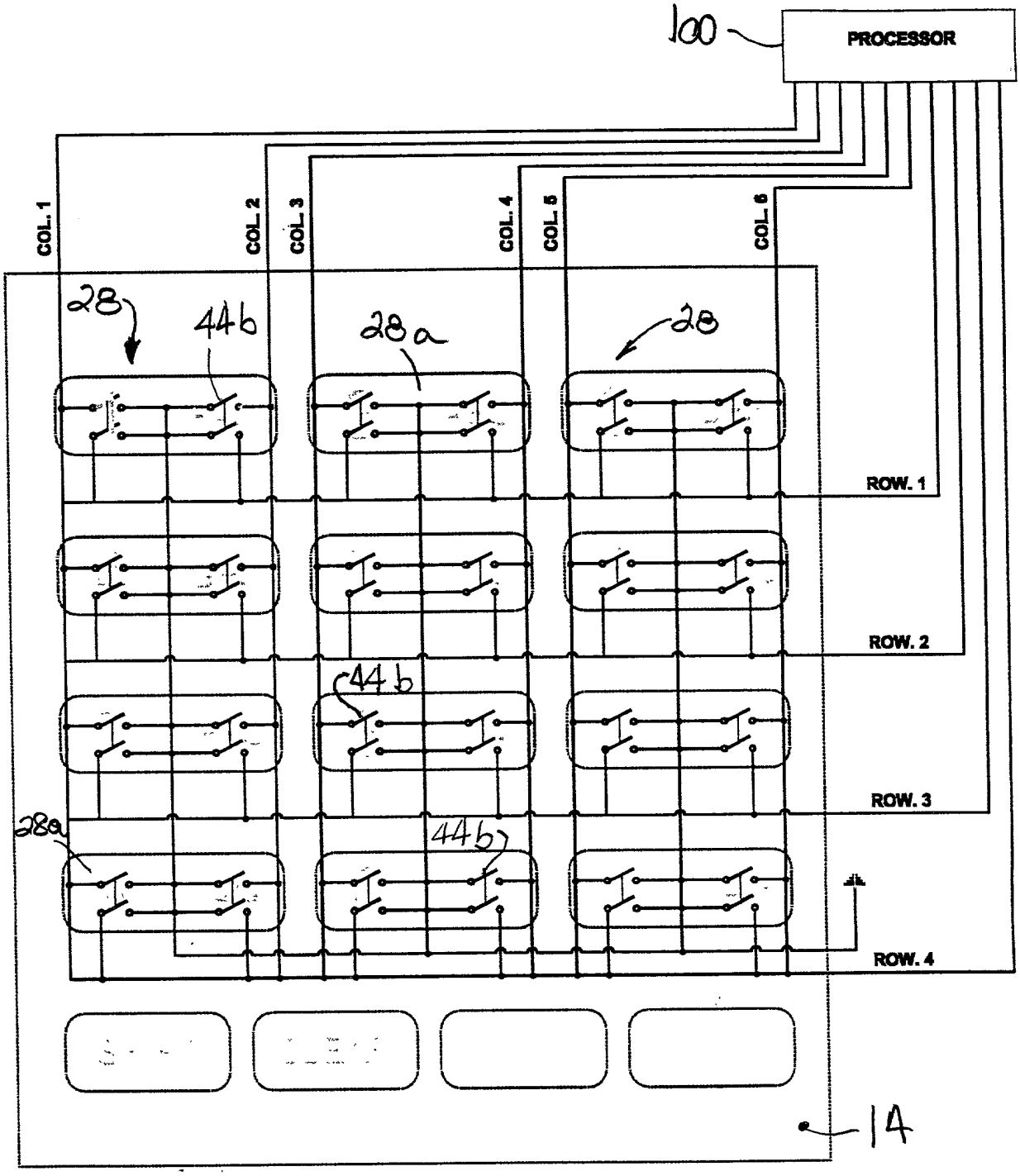

100
PROCESSOR
COL. 1
COL. 2
COL. 3
COL. 4
COL. 5
COL. 6
28
44b
28a
28
ROW. 1
ROW. 2
44b
ROW. 3
28a
44b
ROW. 4
14

FIG. 5A

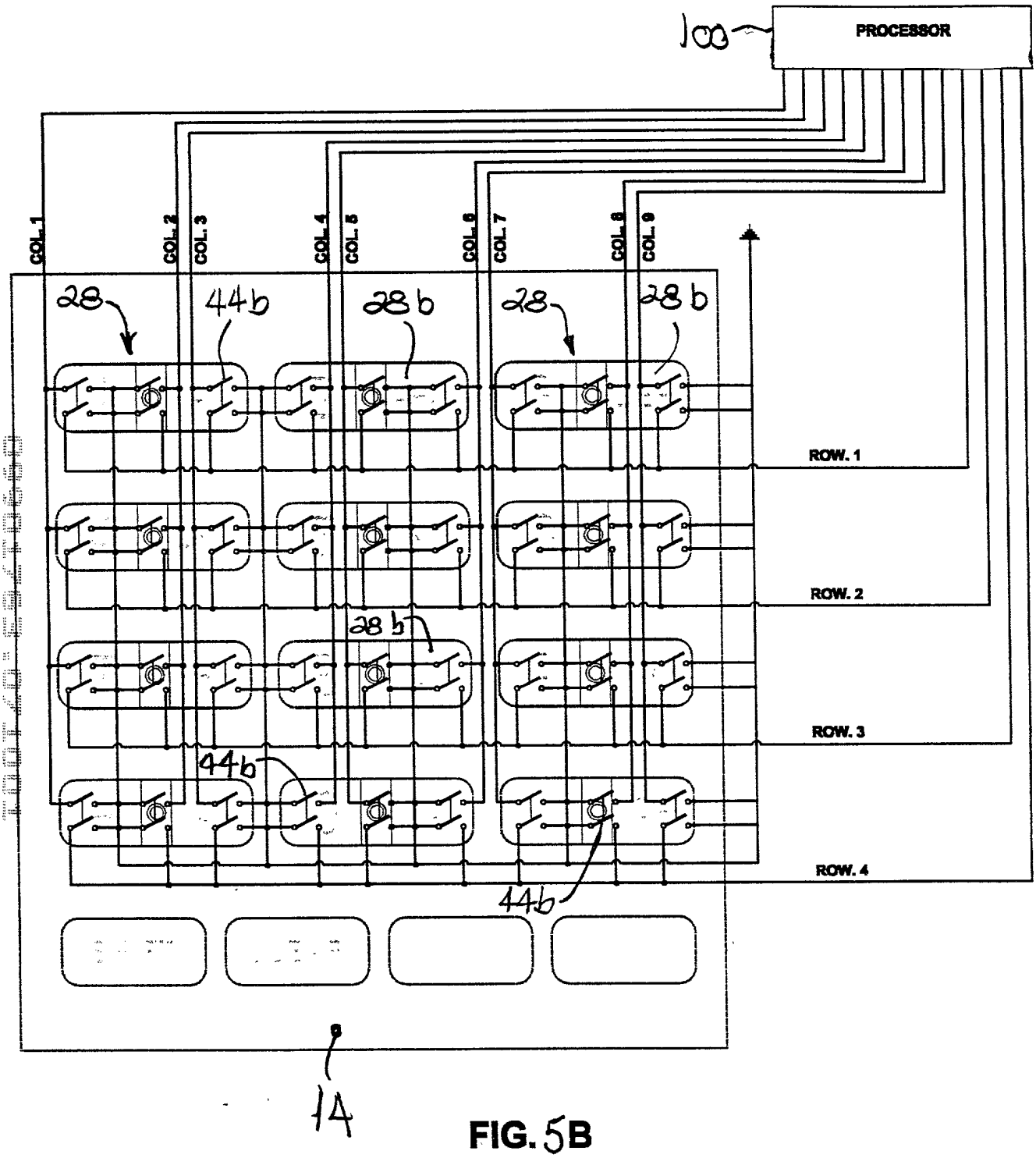

100
PROCESSOR
COL. 1
COL. 2
COL. 3
COL. 4
COL. 5
COL. 6
COL. 7
COL. 8
COL. 9
28
44b
28b
28
28b
ROW. 1
ROW. 2
28b
ROW. 3
44b
ROW. 4
44b
14

FIG. 5B

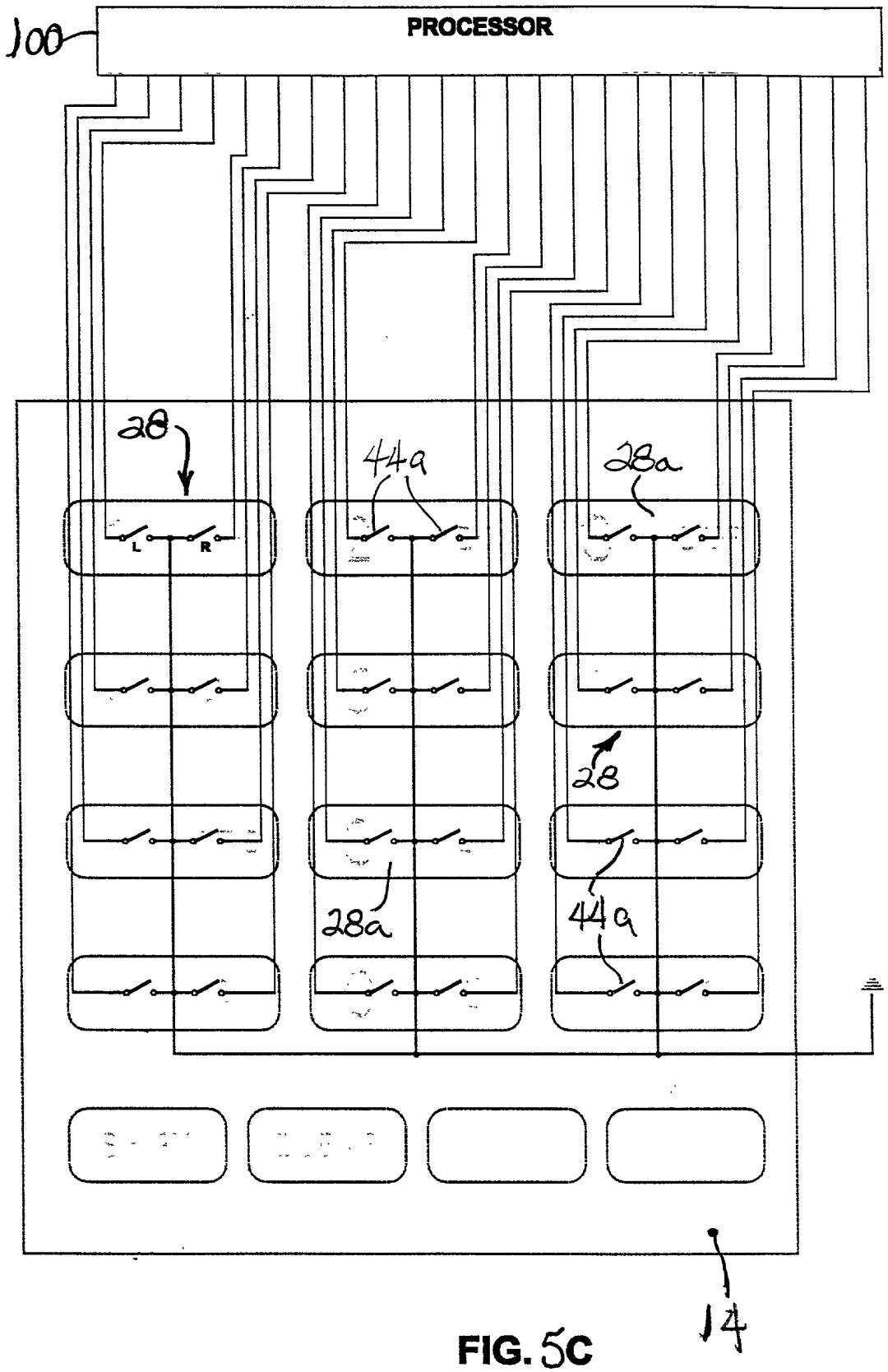


FIG. 5C

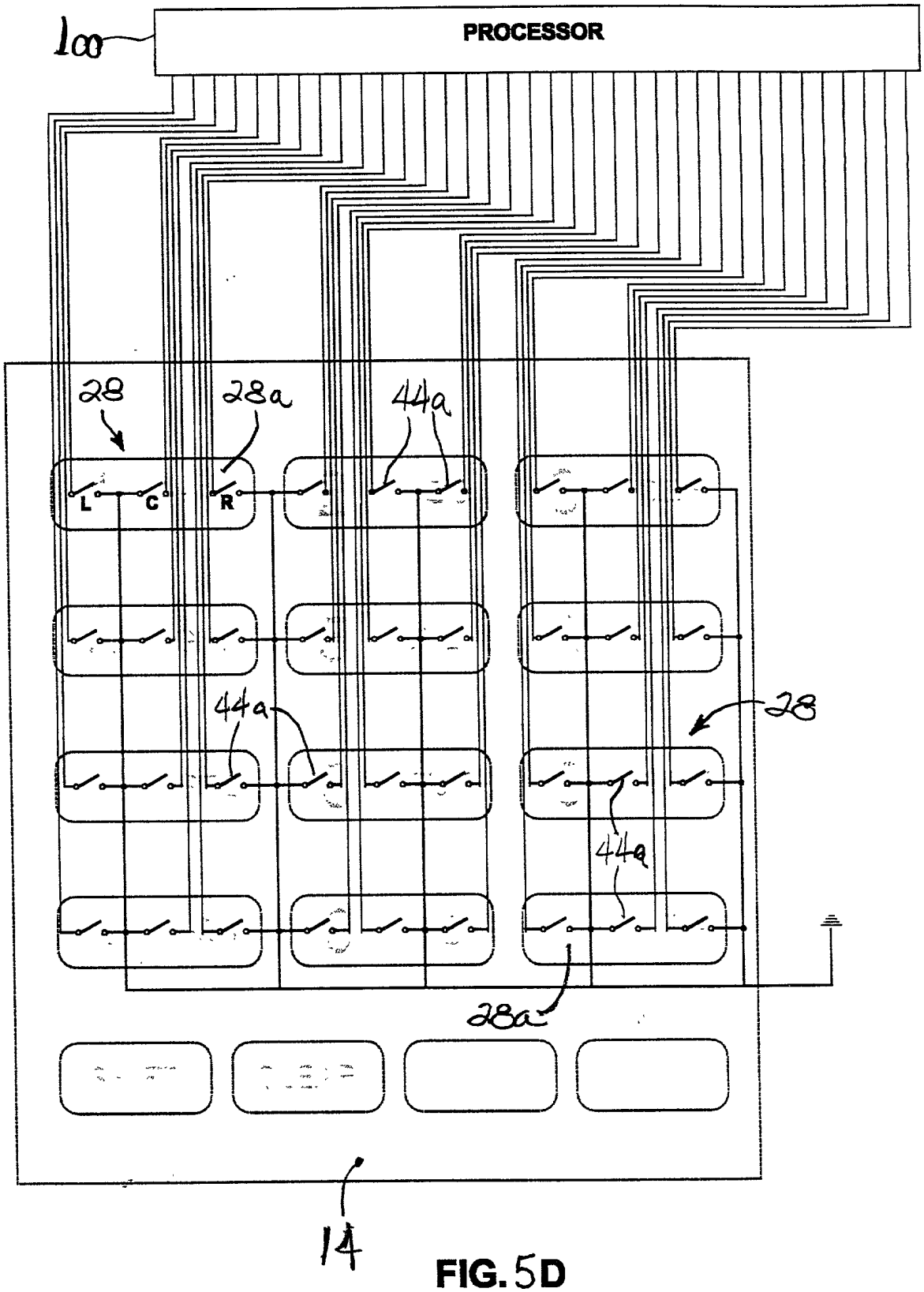


FIG. 5D

		DISPLAY			
Button	**Mode of operation**	**SHIFT Position**	**Action A**	**Action B**	**Action C**
1	NUMERIC/SHIFT OFF		1	1	1
2	NUMERIC/SHIFT OFF		2	2	2
3	NUMERIC SHIFT OFF		3	3	3
4	NUMERIC/SHIFT OFF		4	4	4
5	NUMERIC/SHIFT OFF		5	5	5
6	NUMERIC/SHIFT OFF		6	6	6
7	NUMERIC/SHIFT OFF		7	7	7
8	NUMERIC/SHIFT OFF		8	8	8
9	NUMERIC/SHIFT OFF		9	9	9
*	NUMERIC/SHIFT OFF		*	*	Shift On
0	NUMERIC/SHIFT OFF		0	0	0
#	NUMERIC/SHIFT OFF		#	#	#
1	ALPHA/SHIFT ON	SHIFT	+	-	/
2	ALPHA/SHIFT ON	SHIFT	A	B	C
3	ALPHA/SHIFT ON	SHIFT	D	E	F
4	ALPHA/SHIFT ON	SHIFT	G	H	I
5	ALPHA/SHIFT ON	SHIFT	J	K	L
6	ALPHA/SHIFT ON	SHIFT	M	N	O
7	ALPHA/SHIFT ON	SHIFT	P	R	S
8	ALPHA/SHIFT ON	SHIFT	T	U	V
9	ALPHA/SHIFT ON	SHIFT	W	X	Y
*	ALPHA/SHIFT ON	SHIFT	Q	✱	Shift Off
0	ALPHA/SHIFT ON	SHIFT	\	@	SPACE
#	ALPHA/SHIFT ON	SHIFT	Z	#	•

Fig. 6A

		DISPLAY			
Button	**Mode of operation**	**SHIFT Position**	**Action A**	**Action B**	**Action C**
1	NUMERIC/SHIFT OFF		1	1	1
2	NUMERIC/SHIFT OFF		2	2	2
3	NUMERIC SHIFT OFF		3	3	3
4	NUMERIC/SHIFT OFF		4	4	4
5	NUMERIC/SHIFT OFF		5	5	5
6	NUMERIC/SHIFT OFF		6	6	6
7	NUMERIC/SHIFT OFF		7	7	7
8	NUMERIC/SHIFT OFF		8	8	8
9	NUMERIC/SHIFT OFF		9	9	9
*	NUMERIC/SHIFT OFF		*	*	*
0	NUMERIC/SHIFT OFF		0	0	0
#	NUMERIC/SHIFT OFF		#	#	#
1	ALPHA/SHIFT ON	SHIFT	+	-	/
2	ALPHA/SHIFT ON	SHIFT	A	B	C
3	ALPHA/SHIFT ON	SHIFT	D	E	F
4	ALPHA/SHIFT ON	SHIFT	G	H	I
5	ALPHA/SHIFT ON	SHIFT	J	K	L
6	ALPHA/SHIFT ON	SHIFT	M	N	O
7	ALPHA/SHIFT ON	SHIFT	P	R	S
8	ALPHA/SHIFT ON	SHIFT	T	U	V
9	ALPHA/SHIFT ON	SHIFT	W	X	Y
*	ALPHA/SHIFT ON	SHIFT	Q	(	*
0	ALPHA/SHIFT ON	SHIFT	\	@	SPACE
#	ALPHA/SHIFT ON	SHIFT	Z	)	#

Fig. 6B

KEY PRESSED		INPUT RECEIVED	
		COLUMN	ROW
1	LEFT	1	1
	RIGHT	2	1
2	LEFT	3	1
	RIGHT	4	1
3	LEFT	5	1
	RIGHT	6	1
4	LEFT	1	2
	RIGHT	2	2
5	LEFT	3	2
	RIGHT	4	2
6	LEFT	5	2
	RIGHT	6	2
7	LEFT	1	3
	RIGHT	2	3
8	LEFT	3	3
	RIGHT	4	3
9	LEFT	5	3
	RIGHT	6	3
*	LEFT	1	4
	RIGHT	2	4
0	LEFT	3	4
	RIGHT	4	4
#	LEFT	5	4
	RIGHT	6	4

Fig. 7

Fig. 8

KEY PRESSED		INPUT RECEIVED	
		COLUMN	ROW
1	LEFT	1	1
	CENTER	2	1
	RIGHT	3	1
2	LEFT	4	1
	CENTER	5	1
	RIGHT	6	1
3	LEFT	7	1
	CENTER	8	1
	RIGHT	9	1
4	LEFT	1	2
	CENTER	2	2
	RIGHT	3	2
5	LEFT	4	2
	CENTER	5	2
	RIGHT	6	2
6	LEFT	7	2
	CENTER	8	2
	RIGHT	9	2
7	LEFT	1	3
	CENTER	2	3
	RIGHT	3	3
8	LEFT	4	3
	CENTER	5	3
	RIGHT	6	3
9	LEFT	7	3
	CENTER	8	3
	RIGHT	9	3
*	LEFT	1	4
	CENTER	2	4
	RIGHT	3	4
0	LEFT	4	4
	CENTER	5	4
	RIGHT	6	4
#	LEFT	7	4
	CENTER	8	4
	RIGHT	9	4

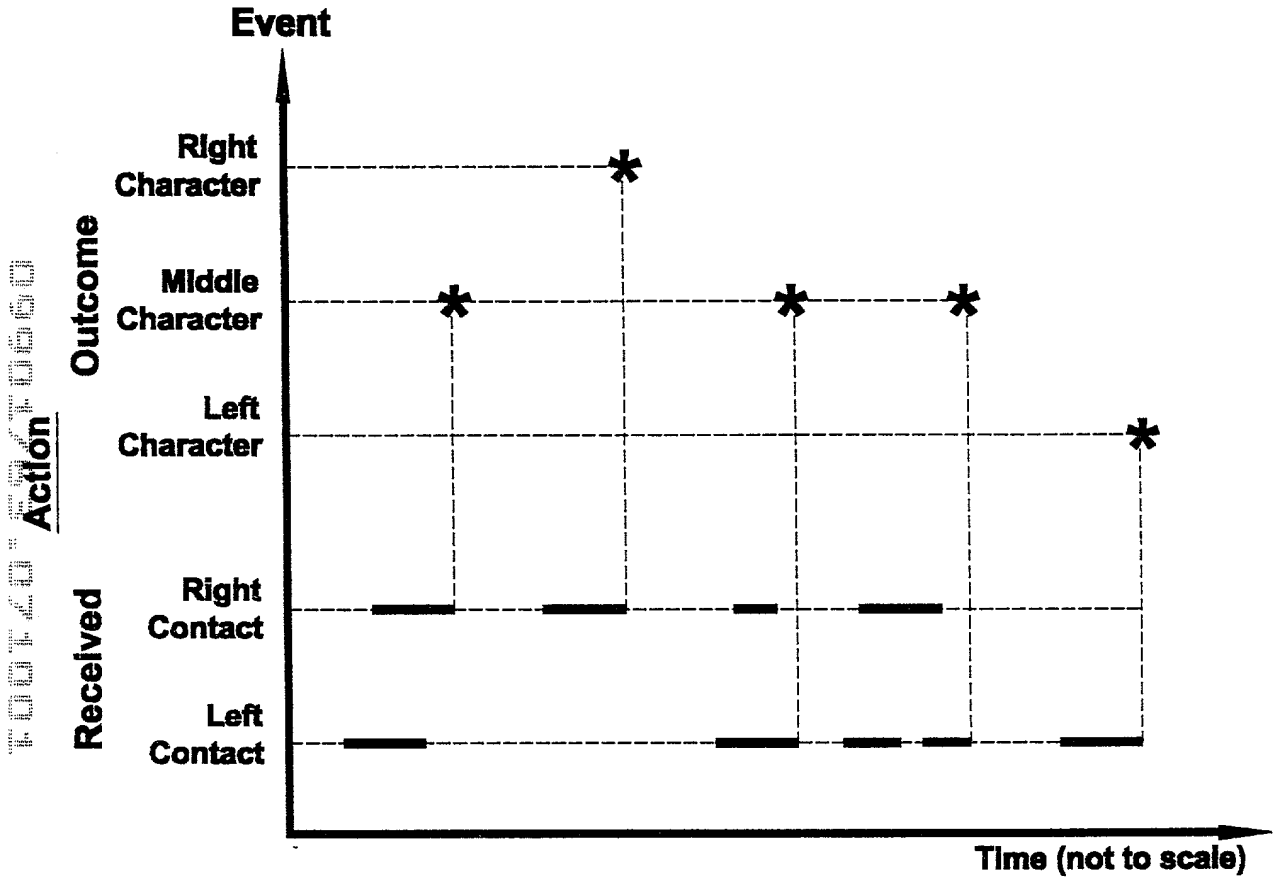

Event
Right Character
Middle Character
Left Character
Outcome
Action
Right Contact
Left Contact
Received
Time (not to scale)

Fig. 9